Claims

1. Method for hydration of a particulate or pulverulent material containing CaO, **characterized in** that water is added in a quantity which will ensure that the partial pressure P_{H_2O} of the added water as a function of the temperature (°C) is maintained within the interval defined by the formula

$$6{,}85 - \frac{5459}{(T+273)} < \log P_{H_2O} < 5{,}45 - \frac{2032}{(T+273)},$$

where P_{H_2O} is the partial pressure of water vapour in atm. and T is the temperature in °C.

2. Method according to claim 1, **characterized in** that that the material containing CaO as well as the water are introduced into an upper end of a vertical reactor, directed down through the latter subject to simultaneous vaporization and hydration, and that the hydrated product is discharged from the reactor at a lower end hereof.

3. Method according to claim 1, **characterized in** that the material containing CaO is introduced into an upper end of a vertical reactor, directed down through the latter subject to simultaneous hydration with water which is introduced at a number of locations distributed across the height of the reactor, where any surplus water in vapour form is discharged through an opening in the upper end of the reactor and where the hydrated product is discharged from the reactor from a lower end hereof.

4. Method according to claim 1, 2 or 3, **characterized in** that the temperature during the hydration process is maintained at a level above 100° C, preferably above 200° C and most preferably above 250° C.

5. Method according to claim 1, 2 or 3, **characterized in** that the partial pressure of the water vapour is maintained within the interval 0.01 to 10 atm., preferably within the interval 0.1 to 2 atm, most preferably within the interval 0.9 to 1.1 atm.

6. Method according to any of the claims 1-5, **characterized in** that some of the hydrated product is recirculated to the hydration unit.

7. Method according to any of the claims 1-6, **characterized in** that hydration is confined to the surface of the material particles.

8. Method according to claim 7, **characterized in** that the degree of hydration is less than 70 %, preferably less than 50 %.

9. Method according to any of the claims 1-8, **characterized in** that the material containing CaO in the form of calcined raw meal is extracted from the calciner of a cement manufacturing plant.

10. Method according to claim 9, **characterized in** that the hydrated product subsequently is re-introduced into the preheater of the cement manufacturing plant immediately after the location, viewed in the direction of movement of the exhaust gases, where SO_2 is formed in order to absorb SO_2.

11. Apparatus for carrying out the method according to claim 2, **characterized in** that it comprises a vertical reactor (6a) incorporating an upper end and a lower end, means (6b, 6c) at the upper end of the reactor for introducing material containing CaO and water either collectively or separately, and means (6d, 6e) at the lower end of the reactor for discharging the hydrated product.

12. Apparatus for carrying out the method according to claim 3, **characterized in** that it comprises a vertical reactor (6a) incorporating an upper end and a lower end, means (6b) at the upper end of the reactor for introducing material containing CaO, means (6f) in the upper end of the reactor for discharging any surplus water in vapour form, means (6c) provided across the height of the reactor for introducing water into the reactor, and means (12) at the lower end of the reactor for discharging the hydrated product.

13. Product provided by the method according any of the claims 1-10.

14. Use of the product provided by the method according any of the claims 1-10 for reducing the SO_2 discharge from a kiln plant.